CLAIMS

What is claimed is:

1. An imaging system using short wavelength radiation, comprising an achromatic Fresnel objective lens.

2. An imaging system as claimed in claim 1, wherein the short wavelength radiation is extreme ultraviolet radiation.

3. An imaging system as claimed in claim 1, wherein the short wavelength radiation is soft x-ray radiation.

4. A system for actinic imaging metrology of short wavelength lithography masks comprising an achromatic Fresnel objective lens.

5. A system as claimed in claim 4, wherein the short wavelength radiation is extreme ultraviolet radiation.

6. A system as claimed in claim 4, wherein the short wavelength radiation is soft x-ray radiation.

7. Achromatic Fresnel lens for radiation with a 13 to 14 nanometer wavelength comprising a zone plate made from molybdenum (Mo), niobium (Nb), Technetium (Tc), or Ruthenium (Ru).

8. A method for imaging 13 to 14 nanometer wavelength, comprising using a silicon refractive lens to correct the chromatic aberration of a zone plate to increase a bandwidth for 13 to 14 nm wavelength radiation.

9. A optical system comprising:
an extreme ultraviolet radiation source;
a spectral filter;
a reflective condenser;

an aperture; and

an objective lens; and

a spatially resolved detector.

10. An optical system as claimed in claim 9, wherein the source is a laser-plasma source.

11. An optical system as claimed in claim 9, wherein the source is a gas discharge source.

12. An optical system as claimed in claim 9, wherein the spectrum filter is a multilayer filter.

13. An optical system as claimed in claim 9, wherein the condenser is a multilayer coated spherical surface.

14. An optical system as claimed in claim 9, wherein a virtual source of the extreme ultraviolet radiation source formed by the condenser and the region of interest of the mask residing on a Rowland circle determined by the condenser.

15. An optical system as claimed in claim 9, wherein the detector is a CCD camera.

16. An optical system as claimed in claim 9, wherein the detector is a CMOS camera.

17. An optical system as claimed in claim 9, wherein the objective lens comprises an achromatic Fresnel optic with a silicon refractive lens.

18. An optical system as claimed in claim 9, wherein the source uses emission from a copper target.

19. An optical system as claimed in claim 9, wherein the objective lens comprises an achromatic Fresnel optic with a refractive lens made from copper.